

## Animals junior

Animals, just like plants and micro-organisms, are living creatures and as such they are born, grow, develop, reproduce and die. Animals can move and have sense organs with which they explore the outside world and search for food. Contrary to plants (**autotrophic organisms**) that produce food with the help of sunlight starting from simple substances that they absorb from the environment, animals must search for food in the environment in which they live. For this reason they are called **heterotrophic organisms**.

The animal kingdom includes at least 30 million species. Invertebrate organisms are characterised by a great diversity of shape and lifestyle; on the contrary, the organisation of vertebrate organisms is very similar. In spite of this, vertebrates have conquered not only the land but also the skies; in fact, they include some of the biggest organisms that have ever lived on the Earth and also our own species. Vertebrates are characterised by a **vertebral column**, or backbone, made up of vertebrae that surround the spinal cord. The vertebrae are separated by discs of cartilage that make the spinal column a flexible bone structure; connected to the vertebrae are the muscles that allow the movement of the different parts of the spine. These animals have an internal bony skeleton made up of living tissue that grows along with the animal until it has reached its full size. Vertebrates are divided into different groups: fish, amphibians, reptiles, birds and mammals. Fish were the first vertebrates to appear on Earth. Depending on the adaptations to the diverse environments they live in, fish have taken on very different shapes. An organ that characterises the majority of fish is the swim bladder, that is full of gas, and which allows the modification of the fish's specific weight (the ratio between the weight and volume of a body) in order to sink or rise in the water without moving its fins. Amphibians, instead, lead a double life; in fact, they live the greater part of their lives in water and the rest of it on land. Before becoming adults, they undergo some transformations that change their aspect completely. From the eggs, tadpoles emerge that initially look like small fish; subsequently, the tadpole changes from the larval stage into a totally developed adult. During the metamorphosis, the tadpoles develop legs, their gills become smaller, then disappear completely and are replaced by lungs, the organs required to breathe air. Lastly, the tail is totally absorbed and disappears. Reptiles also include quadrupeds such as tortoises and crocodiles but the animals that best represent the group are snakes. Reptiles are rather similar to Amphibians, but have an advantage: they can live in arid places, far from water. They breathe by means of lungs and are commonly called "cold-blooded vertebrates"; actually their blood temperature depends on that of the environment. Their body is covered with scales and they reproduce by laying eggs. Birds are animals perfectly designed for flight; in fact, their skeleton is very light, thanks to bones that contain air. Birds' front limbs have been modified into wings, while the back ones are retractile; their bodies are covered with feathers that offer an excellent protection with a minimum of weight. Mammals are homoiothermal: they maintain a constant body temperature of around 37°C. The name "mammal" (literally "bearer of mammary glands") derives from the fact that females nurse their young with milk from the mammary glands. Their body is covered with hair, which is missing or reduced in those species that have adapted to life in the water (cetaceans such as dolphins and whales) and in those provided with scales (such as armadillos and scaly anteaters). With the exception of cetaceans (e.g. dolphin), sirenians (e.g. dugong) and pinnipeds (such as seals and sea lions), whose limbs have developed into fins, all mammals have four limbs and are therefore called quadrupeds.